

Wayne Group
F.I.

#49

If you've read a newspaper or periodical lately, have had a protective undercoating applied to a vehicle, driven on an asphalt road, used something constructed with particle or composite board like a personal computer work station, then you have probably come in contact with "Gilsonite."

GILSONITE®

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Vernal District

History

Native Americans of northeastern Utah were aware of Gilsonite but basically regarded it as worthless. That characterization changed in the early 1880's when samples and word about occurrences of this unique solid hydrocarbon began to circulate.

The mineral, which occurs in nearly vertical veins within Tertiary sedimentary rocks in the Uinta Basin in northeastern Utah and northwestern Colorado, has been given the name "Uintaite" because of its occurrence in the Uinta Basin. In 1886, the mineral's name was changed to gilsonite in honor of Samuel H. Gilson. He purchased many existing lode claims for gilsonite and located many new claims. Samuel Gilson, together with C.O. Baxter, formed the St. Louis Gilsonite Company and helped to promote this truly unique mineral. Some early uses include: an inner liner for beer barrels, an additive to varnishes and paints that were applied to horsedrawn carriages, and as an additive to liquid road asphalt.

Gilsonite veins range in size from a few inches to as much as 28 feet wide. The veins align in a north-

west-southeast direction, which parallels a fracture pattern in the basin due to southwest-northeast extension of the rocks about the time the Uinta Mountains were being uplifted. Veins can be traced along the surface from .5 to 14.1 mile. At least 74 separate veins have been mapped. Over half were given names by the individuals who originally prospected and worked the veins. (One can observe gilsonite veins in the Bonanza, Utah area some 35 miles southeast of Vernal along State route 45.)

So what is gilsonite?

It is quite lustrous, black, opaque, and breaks conchoidally giving it an appearance somewhat like a freshly broken piece of black obsidian (volcanic glass), or like a high grade coal. It is extremely light, having a specific gravity of 1.07 and consists of about 85% carbon and 10% hydrogen by weight. Gilsonite has a hardness of two and can be scratched by the finger nail. It is believed to have been derived from kerogeneous marlstone and shales (oil shales) of the Green River Formation.

Early Mining

Early mining consisted of manually picking and sacking gilsonite into 200- pound bags. Open, vertical trenches were created from extraction by this method and the side walls were supported by timber frames. Horsedrawn wagons were used to haul the bagged gilsonite to rail facilities at Price, Utah. In 1904, the 53-mile narrow gauge "Uintah" railway was completed and it connected the southern mining towns of Dragon, Watson, and Rainbow, Utah (now ghost towns) to Mack, Colorado. The railbed negotiated the Book Cliffs divide at Baxters Pass, at 8,500 feet elevation. The use for the railway ended in 1935 due to the increasing use of truck transportation and the relocation of gilsonite mining north to the Bonanza, Utah area.

Mine Development and Operation

Wet mining, using jet streams of water to dislodge the friable gilsonite from the surrounding rock, was undertaken in the 1950's partially to suppress the explosive dust problems which sometimes plagued earlier dry mining. The wet product was pipelined in a slurry mixture to a refinery near Fruita, Colorado along a passage that often followed the old Uintah railway bed. At the refinery it was used in the production of high grade coke and high grade octane gasoline. The slurring ended about 1974 and the pipeline was converted to carry natural gas.

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Today, as in the past, gilsonite is mined by hand, except today a hand-held air-driven chipping hammer is used. The

miners work to advance a small vertical face up a 45-degree slope. The chipped material gravity feeds downslope to a vacuum pipe that conveys it to a holding silo at the surface. The void left as a result of mining is kept propped by mine timbers. Gilsonite is cited as being used in

over 160 products today. Some of the uses depend upon melt or softening point that often varies between veins and can even vary within a single vein. Some modern uses are in printing inks, paints and protective coatings, drilling muds and cements, a reinforcing agent in asphalt road hot mixes, an additive to foundry sands, and a composite wood sheet binder.

The American Gilsonite Company, Lexco, and Ziegler Chemical and Mineral are currently involved with production of gilsonite. Gilsonite is classified as a leasable mineral under 43CFR 3550. The Vernal District is currently the only location in the Bureau where gilsonite is leased and prospected for under the regulations.



Left: Cowboy gilsonite vein east of Bonanza, Utah. This vein, located on private land and about 20 feet wide, was probably open-trench mined in the 1950's (note timber supports). Today, a wedge of unmined material is left at the surface so open trenches are no longer left as a result of mining.

Below: Cowboy Vein in a shallow working north of Bonanza, Utah (about 5 miles northwest of photo 1 location). Uinta Formation sandstone forms the wall of the vein which is about 24 inches wide at this location. A U.S. Geological Survey bulletin on fracturing and gilsonite emplacement is nearing publication.

